

FACT SHEET

(Pursuant to Nevada Administrative Code (NAC) 445A.401)

Permittee Name: **Nevada Gold Mines LLC**

Project Name: **Mill 1 Project**

Permit Number: **NEV0091013**

Review Type/Year/Revision: **Renewal 2022, Fact Sheet Revision 00**

A. Location and General Description

Location: The Mill 1 Project is located in Eureka County, within Sections 10, 11, 14, and 15, Township 35 North, Range 50 East, Mount Diablo Baseline and Meridian, approximately 18 miles northwest of the town of Carlin, Nevada. The facility is located on approximately equal portions of private land and land administered by the U.S. Bureau of Land Management, Tuscarora Field Office, in Elko, Nevada.

To access the site, drive on Interstate 80 to exit 280 in Carlin, Nevada. Drive north on Nevada State Route (SR) 766 for 11.2 miles. Turn left and continue on SR 766 for 7.8 miles to a tee intersection. Turn left and proceed 0.3 miles to a gate controlled by the Permittee at the Project site.

General Description: The Mill 1 Project comprises the remaining process components from the Permittee's first gold mining operation in the Carlin Trend, which dates back to 1965. The Mill 1 Project is in permanent closure; therefore, Water Pollution Control Permit (WPCP) NEV0091013 (Permit) includes only the components that are being permanently closed. The Project includes the Mill 1 Tailings Storage Facility (TSF); the TSF Seepage Collection Pond (SCP) and associated seepage collection return pumping system; the Carlin West Pit, which was also used for tailings deposition in the 1980s; and a network of groundwater pumpback wells and monitoring wells downgradient of both the TSF and SCP. The crushing and milling portions of the facility have previously been removed and permanently closed.

For permitting purposes, the remaining portions of the Carlin Pit, components and infrastructure associated with the East Carlin Underground Mine in the east portion of the Carlin Pit, and all waste rock dumps associated with the mining of the Carlin Pits, are not included in the Mill 1 Project. Instead, these are included as part of the Mill 5/6 – Gold Quarry – James Creek Project (WPCP NEV0090056); they are not currently considered to be associated with the required permanent closure of the Mill 1 TSF. The State of Nevada Division of Environmental Protection (Division) has determined that the TSF, the SCP, and associated components have reached the end of their design lives and have degraded groundwater; therefore, they must be permanently closed pursuant to NAC 445A.446.

B. Synopsis

Overview: In 1965, the Carlin Gold Company, a subsidiary of Newmont Mining Corporation and predecessor of the previous Permittee, Newmont USA Limited dba Newmont Mining Corporation (Newmont), started the production of gold from the open-pit Carlin Mine. Approximately 2,000 to 2,400 tons per day of high-grade oxide ore were processed in the Carlin Mill, later known as Newmont Mill No. 1 or Mill 1 for short. Mill 1 was an agitation and countercurrent decantation cyanide leaching plant. An expansion of

Mill 1, to treat an additional 500 tons per day of refractory carbonaceous ore by pre-oxidation with a chlorine solution, was put into operation in 1971. Process tailings slurry discharged to the Mill 1 TSF contained high chloride concentrations as a result of the mill chlorination circuit. Mill 1 ceased operation in early 1995.

The Division assigned WPCP number NEV0091013 to the Mill 1 Project in 1991, but no Permit application was received until December 2016. Newmont USA Limited was finally issued a Permit for the Project in 2017. However, the Division had performed periodic compliance inspections at the Project since 2001 or before, and, in accordance with Division requirements, the Permittee began submitting monitoring reports for the Project in 2004. In July 2019, the Permit was transferred from Newmont USA Limited to Nevada Gold Mines LLC following a merger between Newmont and Barrick Gold of North America.

Geology: The Carlin Mine is located on the northeastern edge of the Lynn Window in the Roberts Mountains Thrust sheet. The thrust sheet was emplaced during the Devonian to Mississippian Antler Orogeny. Four Paleozoic lithologic units are recognized in the Carlin gold deposit: the Silurian and Devonian Roberts Mountains Formation (Fm), the Devonian Popovich Fm, and the Devonian Rodeo Creek Fm, all of which comprise the lower plate assemblage of the Roberts Mountains Thrust, and the Ordovician and Silurian Vinini Fm, which comprises the upper plate of the Roberts Mountains Thrust. In the Project area, the Roberts Mountains Fm consists of silty limestone with a variable basal black chert unit, and the Popovich Fm is a mixture of silty limestone, calcarenite, bioclastic limestone, micrite, and limey debris flows. The Rodeo Creek Fm consists of siltstone, cherty siltstone, siliceous mudstone, and sandstone, while the Vinini Fm consists of siltstone, siliceous mudstone, and bedded chert. Quaternary alluvium locally overlies the Paleozoic rocks.

The ore deposit has undergone at least five different periods of faulting. All faults are considered to predate the gold mineralization, except for possible post-mineral reactivation of the younger faults that coincide with Basin and Range tectonic development. The Paleozoic rocks display the following hydrothermal alteration assemblages: argillization, silicification, sulfidation, and decarbonatization. Gold mineralization is typically strata bound and stratiform, and occurs in decarbonized, argillized, and silicified rocks.

Open Pits and Waste Rock Storage Facilities: As noted above, the Carlin Pit and its associated waste rock storage facilities have been excluded from this Permit because they are not currently considered to be associated with the required closure of the Mill 1 TSF. These components are included instead in the Mill 5/6 – Gold Quarry – James Creek Project (WPCP NEV0090056). The Carlin West Pit, however, is included in the Mill 1 Project Permit, because it was used for tailings deposition in the 1980s – see the section below for the West Pit TSF.

Mill 1: As noted above, the crushing and milling portions of the facility, which were previously located adjacent to the southeast side of the TSF, have been removed and permanently closed. In 1996, the Division approved the removal of the mill circuit, thickener circuit, carbon-in-leach (CIL) circuit, chlorination circuit, refinery, and all associated tanks, piping, pumps and ancillary equipment. The demolition of Mill 1 began on 1 August 1997 and was completed on 30 October 1998.

On 19 March 2014, the Division approved a July 2013 final closure report for the remediation, closure, and demolition of the Mill 1 refinery and ancillary Mill 1 buildings,

which occurred from February 2011 to June 2013. Asbestos, lead-based paint, and hazardous and universal waste were removed and properly disposed of off-site. Remediation of contaminated soil was performed by the Permittee at the former sites of the Mill 1 refinery and ancillary Mill 1 buildings. Mercury-contaminated soil associated with the refinery, and petroleum-contaminated soil (PCS) associated with the truck wash bay, truck shop, and light-vehicle shop, were excavated and properly disposed. Proposals for no further corrective action pursuant to NAC 445A.227.2 (a-k) for remaining soil contamination were approved by the Division on 22 January 2013. Scrap metal was sold for recycling. Building demolition waste was disposed in the Permittee's North Area Class III waived landfill. Approximately 15 feet of waste rock was placed over the remaining broken-up concrete foundations at the site. The approved plan also included regrading the waste rock dump, covering it with a layer of growth media, and reseeded in the fall of 2013. A portion of the Mill 1 site is now used for parking to support the Permittee's other mining-related activities.

Closure of the Mill 1 septic tank and associated leach field on the Mill 1 TSF was completed in July 2013, with regulatory oversight by the Division's Bureau of Water Pollution Control (BWPC). The septic sludge was disposed of in the Permittee's Mill 5/6 Central TSF (WPCP NEV0090056) in accordance with BWPC Permit NEV95016. The outlets to the leach field were plugged. The tank was demolished in place to prevent the entrapment of water and that area of the Mill 1 TSF was backfilled.

Mill 1 TSF: The Mill 1 TSF consists of a cross-valley embankment and upstream impoundment of tailings that was constructed in 1965 and subsequently expanded at regular intervals by modified centerline and upstream construction methods using mine waste as fill material. The final embankment raise, to a total height of approximately 300 feet (6,116 feet above mean sea level [AMSL]), was completed in 1991. An estimated 24.5 million tons of tailings were deposited in the Mill 1 TSF over its active lifespan from 1965 to early 1995. In general, throughout the operational history of the facility, tailings were deposited from the crest of the main embankment allowing supernatant fluids and meteoric run-on to collect in a supernatant pool at the low point on the tailings surface within the TSF basin. The TSF covers a surface area of approximately 128 acres. The Permittee's North-South Haul Road traverses across the western (downstream) face of the TSF embankment, and another haul road was constructed over the TSF basin in 2015 (see below: shortcut haul road). The downstream embankment slope consists of a series of intermediate benches (including the North-South Haul Road) with an approximate overall slope of 3H:1V (horizontal to vertical).

The TSF was constructed prior to the 1989 promulgation of Nevada Water Pollution Control mining regulations. Consequently, the TSF does not meet the Division's current minimum design criteria for tailings impoundment construction. Limited documentation is available regarding the early dam construction and TSF operation; however, it is known that the TSF is an unlined impoundment constructed on a combination of native alluvial and colluvial soils and weathered bedrock. The Division is not aware of any data regarding compaction of the mine waste materials used in the TSF embankment or of the native materials used in the TSF basin; however, two laboratory percolation tests performed by Dames and Moore (17 October 1984, Design Evaluation Expansion of Existing Tailings Pond Embankment) on tailings solids samples collected near the embankment indicated permeabilities of 3.3×10^{-7} centimeters per second (cm/sec) and 8.5×10^{-7} cm/sec. Except

for a 100-foot high starter dam, which was constructed entirely of waste rock, the pre-1984 modified centerline embankment construction included three zones: a downstream waste rock embankment shell, a chimney drain constructed from cycloned sand, and a nearly vertical upstream waste rock embankment zone. The chimney drain extends downward along the downstream slope of the starter dam as an inclined blanket drain and provides general phreatic control to the embankment. The chimney drain was not continued upward above 6,080 feet AMSL into the last four small embankment raises, which were constructed during the period 1984-1991, and together raised the embankment crest approximately 36 feet to its final elevation.

The supernatant pool has been in at least two different locations within the TSF basin over the operational history of the Project: on the south and northwest sides of the TSF. In 2017, the supernatant pool was located near the northwest corner of the TSF, where it received TSF seepage solution after it was pumped back to the TSF from the Seepage Return Pump House associated with the SCP. A French drain (aka the Toe Drain) was constructed in 1990/1991 at the toe of the TSF embankment to collect additional TSF seepage solution following the detection of degraded groundwater downgradient (west) of the TSF. The Toe Drain also receives the seepage solution from the embankment chimney drain. Seepage solution from the Toe Drain is conveyed to an adjacent French drain constructed underneath the SCP, from which it is pumped into the SCP and back to the TSF via the Seepage Return Pump House.

Between 1995 and 2006, the Permittee covered the Mill 1 tailings with 642,893 tons of oxide and non-potentially acid generating (non-PAG) waste rock and alluvium to facilitate dust control, drying of the tailings surface, and consolidation and dewatering of the tailings mass. The cover material, which forms a 10- to 21-foot layer over the tailings, also serves as growth medium for revegetation.

In November 2009, the Permittee performed a study to evaluate the possibility of using Mill 1 tailings, and other tailings sources, as an ingredient for cemented paste backfill in the underground Leeville Mine (WPCP NEV0090056). Six sonic borings were advanced into the upper portion of the Mill 1 tailings for geochemical and geotechnical analyses. The Permittee subsequently determined that the Mill 1 tailings were unsuitable for paste backfill and instead selected the tailings from the Mill 4/2 TSF (North Area Leach Project, WPCP NEV0087065) for delivery to the Leeville paste backfill plant.

The tailings in the Mill 1 TSF were also characterized as part of the studies in support of the 2014 FPPC. Thirteen tailings samples from seven geotechnical boreholes drilled in 2012 in the TSF basin were analyzed for the ratio of acid neutralization potential to acid generation potential (ANP/AGP), mineralogy, and various geotechnical parameters. The tailings were shown to be weakly neutralizing, with total sulfur contents of 0.13-0.58 percent (%), and ANP/AGP of 4.5-40.3. The mineralogical determinations indicate the presence of 4-14% calcite and 5-20% dolomite in the tailings samples. Therefore, the tailings are not expected to generate acid.

The North Diversion Ditch is an earthen channel on the north side of the TSF that intercepts stormwater and diverts it to the west and downstream of the TSF. The North Diversion Ditch terminates on a steep slope approximately 3,500 feet northwest of the TSF. The 2014 FPPC for the TSF, described below, includes a reconstructed outfall for the North Diversion Ditch. On the south side of the TSF the North-South Haul Road intercepts

stormwater; however, a small volume of stormwater run-on to the TSF occurs from precipitation that falls between the south side of the TSF and the North-South Haul Road.

Eleven piezometers installed in the downstream TSF embankment face were functional at least through March 2002. These piezometers showed a continual gradual decline in the phreatic surface within the embankment. Stability evaluations performed in 1984 and 1991 concluded that the TSF embankment was stable. A 2013 study, included in the 2014 FPPC for the TSF, reevaluated the long-term closure stability of the dam under both static and seismic loading conditions. The 2013 study resulted in the following conclusions: 1) static factors of safety for both upstream and downstream slope stability exceed 2.1; 2) pseudo-static simulation of a design earthquake with a 2,475-year return period (2% probability of exceedance in 50 years) resulted in a factor of safety of 1.1; 3) a post-liquefaction analysis considering a conservative hypothetical scenario in which the entire tailings mass liquefies yielded a factor of safety of 2.1; 4) based on the predicted reductions in draindown flow and phreatic pressure within the tailings over time, the calculated factors of safety are expected to increase in the future. The analyses identified upstream instability in the near surface (upstream raise portion) of the TSF to be the most critical stability condition. The calculations conservatively considered the top of the tailings to be saturated based on the most critical cone-penetrometer observations; however, large portions of the upper tailings were also observed to be dry and the remaining saturated portions of the upper tailings are expected to dry and become more stable over time.

The 2014 FPPC also predicted future draindown, consolidation, and settlement rates for the Mill 1 TSF based on data from geotechnical test pits, piezometers (B1, B3, B5, B6, B7, and B9), and settlement monuments installed in 2012. Since then, all of the piezometers except B6 have failed. The predicted draindown flow rate 10 years after the completion of cover placement in 2006 (by 2016) was 8-21 gpm. This prediction was an overestimate, as the actual 2016 average total return pumping rate from the SCP back to the TSF was 3.37 gpm; as of the 2022 Renewal it was fairly dry. Water in the SCP appears to be meteoric in nature. The total return pumping rate is used to approximate the TSF draindown flow rate because there is no single monitoring point where the TSF draindown flow rate can be measured directly. The total return pumping rate is only an approximation of the TSF draindown flow rate. It includes the pumping rate from the groundwater remediation system (and does not account for evaporative losses from the SCP or any seepage that could be bypassing the SCP). The TSF draindown flow rate is predicted to decline ultimately to 1-3 gpm. The Permit includes routine monitoring for three of the original six 2012 TSF basin piezometers to provide data on the dewatering of the TSF. On 12 September 2019, the Permittee submitted an engineering design change (EDC) to remove from the Permit three inoperable piezometers, B3, B7, and B9. These piezometers were damaged during closure and reclamation activities and no longer functioned. The Division approved the request, and the broken equipment was removed from the Permit.

On 11 November 2021, the Permittee submitted an EDC to replace two TSF piezometers, B1 and B5, that became inoperable that year. They were replaced in the Permit with B1B and B3B. Installation was subject to driller availability and a timeframe for installation was not clear. The Permit revision, 05, included an SOC item ensuring the piezometers would be installed before the 2022 renewal package was due in July 2022. This was accomplished and the record of construction was received on 15 August 2022 and has been approved.

The 30 October 2014 FPPC for the Mill 1 TSF proposed a three-stage closure process. Stage I included regrading and revegetation of the existing waste rock cover on the TSF (mostly done by 2017) and modification of stormwater diversions so that meteoric precipitation is shed off of the TSF. On 28 February 2022 the Division received an update to Phase I closure. This was approved on 7 March 2022. Stage II includes down-sizing the draindown return pump and piping system to match the reduced flow rates pumped back to the TSF, and completion of the stormwater diversion network including the lower North Diversion Channel below the TSF Northwest Drainage Outfall. Stage III proposes closure of the SCP and solution return pump and piping system, and installation of an infiltration gallery, constructed wetlands, or evapotranspiration (ET) cell; a discussion of the installation of an evaporation cell (E-cell) has since been discussed as well. A portion of the FPPC pertaining to construction of a new shortcut haul road and stormwater drainage culvert on the TSF was approved by the Division in correspondence dated 10 February 2015, and construction of the haul road and culvert was completed in September 2015. On 2 August 2017, the Division responded with technical comments to the remainder of the FPPC. The 2017 new Permit included a schedule of compliance (SOC) item requiring revision of the 2014 FPPC to address the Division's technical comments, and once approved, implementation of the FPPC in accordance with a Division-approved schedule. The revised FPPC was submitted on 1 June 2018 and approved with revisions on 16 April 2019.

The 2021 to 2022 Phase 1-related closure work included the following:

- Construction of new Evaporation Pond (E-Pond) on the TSF surface;
- Regrading and adding cover fill (as needed) to establish final closure surface to promote positive drainage, reduce infiltration into tailings, and promote re-vegetation;
- Construction of new Seepage Collection Pump system including a seepage cutoff trench, wet well, and pipelines;
- Seeding of graded areas for re-vegetation;
- North Diversion Channel outfall improvements; and
- Installation of two piezometers (B1B and B3B) on the surface of the Mill 1 TSF surface to replace failed piezometers B1 and B3.

West Pit TSF: Tailings deposition also occurred in the Carlin West Pit in the 1980s. The West Pit TSF is located immediately south of the Mill 1 TSF, southwest of the former Mill 1 site, and just west of the Carlin Pit. The West Pit TSF was subsequently completely covered with approximately 20 feet of alluvial waste rock during the period 1998-2000. A facility operated by the Permittee's blasting contractor is located on the covered West Pit TSF.

Seepage Collection Pond (SCP) and Seepage Return Pump House: The SCP is located at the downstream western toe of the Mill 1 TSF embankment. The pond was initially constructed in 1965, prior to the 1989 promulgation of Nevada Water Pollution Control mining regulations; consequently, the pond does not meet the Division's current minimum design criteria for process ponds. The pond has a total capacity of approximately 250,000 gallons. The SCP initially featured vertical concrete walls, and apparently an earthen floor.

The pond is split down the middle into two separate cells (the East SCP and the West SCP) via a vertical concrete divider wall. In 1991, as a result of the detection of contaminated groundwater downgradient of the Mill 1 TSF and SCP, a gravel French drain with two sumps and ports (West French Drain Port [SCPWFD] and East French Drain Port [SCPEFD]) were installed under the SCP, and a single 80-mil high-density polyethylene (HDPE) geomembrane liner was installed on the bottom, side walls, and divider wall of the SCP.

The Seepage Return Pump House is located adjacent to the SCP for the purpose of pumping the TSF seepage solution (and contaminated groundwater from the groundwater remedial pumpback system) from the pond back to the TSF via a 6-inch diameter HDPE seepage return pipeline and a level-controlled pump. The seepage return pipeline is aligned on the ground surface except where it is buried under road crossings. The Seepage Return Pump House includes a concrete secondary containment floor and sump, which convey any spillage back to the SCP. Much of the seepage return infrastructure was rebuilt/replaced when the new evaporation basin was installed in 2021/2022. The Division has been encouraging the Permittee to consider converting the Seepage Collection Pond to an evaporation cell. The 2018 Revised FPPC confirms that an E-cell will be constructed but the location has not been finalized.

The average chemistry of the solution in the SCP, as reported in the 2014 Mill 1 TSF FPPC for the period 1990 to 2012, included exceedances of Division Profile I reference values for arsenic (0.033 milligrams per liter [mg/L]), chloride (2,126 mg/L), manganese (4.44 mg/L), mercury (0.021 mg/L), nitrate + nitrite as N (11 mg/L), and total dissolved solids (TDS, 4,837 mg/L).

TSF seepage solution is conveyed to the SCP via a pipe from the TSF embankment Toe Drain. The Toe Drainpipe is not easily accessible and hence is not directly monitored as part of the Permit requirements; however, the total seepage returned to the TSF is a proxy for the TSF seepage and is monitored as noted below. Another French drain with two sumps was constructed underneath both cells of the SCP, probably as part of the 1990 relining of the pond. Solution collected in the French drain beneath the pond is pumped from the two ports (SCPWFD and SCPEFD) into the SCP via float-controlled sump pumps. The Permit requires routine monitoring of the water quality and volume of seepage pumped from each port. The Permit also requires routine monitoring of the water quality and volume of the total seepage return solution (SRS) pumped back to the TSF from the Seepage Return Pump House. Since 2022 the SRS is sent to the top of the TSF to be evaporated in the lined E-Pond.

Groundwater Remediation System: In February and March 1990, Newmont installed groundwater monitoring wells M1-SC1, M1-SC2, M1-SC3A, M1-SC3B, M1-SC4A, M1-SC4B, M1-SC5A, and M1-SC5BA downgradient of the Mill 1 TSF and SCP. Degraded groundwater was detected, and a remedial action program was initiated in 1990 and 1991. Remedial actions included French drain installation at the toe of the Mill 1 TSF embankment and under the SCP; installation of a synthetic liner in the SCP; dewatering of the Carlin West Pit TSF; relocation of the Mill 1 TSF supernatant pool; fresh water and process solution pipeline repair; selective well abandonment; and the installation and operation of two downgradient collector (pumpback) wells, identified as wells M1-1 and M1-1-2. The collected contaminated groundwater is pumped from the pumpback well to the SCP via a buried double-walled pipeline constructed of a 2-inch diameter polyvinyl

chloride (PVC) inner pipe inside a 4-inch diameter outer pipe. Pursuant to the Permit, the pumpback pipeline leak detection port (PBPLDP) is routinely monitored for leakage.

After a lapse of regular monitoring and pumpback well operation by Newmont beginning in 1997, as a result of wells drying up due to dropping groundwater levels, the Division rediscovered the groundwater remedial system during a site inspection in February 2004. Regular monitoring and pumpback well operation resumed shortly thereafter in 2004. In response to follow-up reports by Newmont, the Division determined in correspondence, dated 14 February 2005, that exceedances of Division Profile I reference values for chloride and TDS in monitoring well M1-SC5A were associated with contamination leaking from the Mill 1 TSF, and possibly the SCP, into the shallow aquifer and moving downgradient past the pumpback wells after the cessation of regular pumping in 1997. The Division required continued operation of the remedial and monitoring system to mitigate the contamination and prevent further downgradient migration of the groundwater contaminant plume, and instituted quarterly reporting of monitoring results to the Division. An evaluation of the performance of the remedial and monitoring system was also required, and was submitted by Newmont on 16 May 2005. In the evaluation, Newmont documented that groundwater levels had rebounded enough for resumed operation due to higher precipitation years.

On 11 October 2018, the Permittee submitted an EDC requesting authorization to drill three new monitoring wells (SC-3C, SC-4C, and SC-5C) downgradient of the SCP to replace three shallow wells (M1-SC3A, M1-SC4A, and M1-SC5A) being affected by dewatering activity. The new wells were planned to be much deeper: SC-3C (110 feet below ground surface, bgs), SC-4C (162.5 feet bgs), and SC-5C (145 feet bgs). The Division approved the EDC in October 2018; the Permit and Fact Sheet were updated. As of the 2022 Renewal, most of the wells had insufficient water in them to sample. Well construction data, and the respective alluvial aquifers that are screened, are shown in Table 1. Table 2A shows well chemistry before they went dry. Table 2B shows current conditions.

Table 1: Well Construction Data.

Well ID	Function	Alluvial Aquifer	Collar Elevation (ft. AMSL) ^(a)	Top of Screen (ft. bgs) ^(b)	Bottom of Screen (ft. bgs) ^(b)	Total Depth (ft. bgs) ^(b)
M1-1	Pumpback	Upper	5,817.83	15	40	40
M1-1-2 ^(c)	Monitoring	Upper	5,817.07	Unavailable	Unavailable	44
M1-SC1	Monitoring	Upper	5,850.75	30	35	35.5
M1-SC2	Monitoring	Upper	5,938.89	51.5	56.5	56.5
M1-SC3B	Monitoring	Lower	5,823.19	64.5	69	69
M1-SC3C	Monitoring	Upper	5,820.08	160	200	200
M1-SC4B	Monitoring	Lower	5,767.39	117	122.5	122.5
M1-SC4C	Monitoring	Lower	5,765.97	220	260	260
M1-SC5B	Monitoring	Lower	5,724.80	101.5	105.5	106
M1-SC5C	Monitoring	Lower	5,761.98	105	145	145

(a): ft AMSL = feet above mean sea level.

(b): ft bgs = feet below ground surface.

(c): Well M1-1-2 was a pumpback well until March 2010 and a monitoring well since then.

Table 2A: First Quarter 2005 Division Profile I Monitoring Well Data.

Parameter	Division Profile I Reference Values (mg/L)	M1-1 (mg/L)	M1-1-2 (mg/L)	M1-SC2 (mg/L)	M1-SC4A ^(a) (mg/L)	M1-SC5A ^(a) (mg/L)	M1-SC5B (mg/L)
Aluminum	0.2	ND ^(b)	ND	ND	0.36	ND	ND
Arsenic	0.01	ND	ND	ND	ND	ND	ND
Beryllium	0.004	ND	ND	ND	0.011	ND	ND
Cadmium	0.005	ND	ND	ND	0.017	ND	ND
Chloride	400	ND	ND	ND	478	402	ND
Iron	0.6	1.81	0.92	ND	ND	ND	ND
Manganese	0.1	0.26	ND	0.63	0.50	ND	ND
pH (SU)	6.5 – 8.5	ND	ND	ND	5.81	ND	ND
Selenium	0.05	ND	ND	ND	ND	ND	ND
Sulfate	500	ND	ND	ND	ND	ND	ND
TDS	1,000	ND	ND	ND	1,270	1,150	ND

- (a) The “A” labeled wells were removed from the Permit in May 2019 after they became dry. They were replaced with “C” labeled wells, M1-SC3C, M1-SC4C, and M1-SC5C.
- (b) ND = Not detected; analytical result was below one half of the Division Profile I reference value.

Table 2B: Second Quarter 2022 Division Profile I Monitoring Well Data.

Parameter	Division Profile I Reference Values (mg/L)	M1-1 (mg/L)	M1-1-2 (mg/L)	M1-SC1 (mg/L)	M1-SC2 (mg/L)	M1-SC3B (mg/L)	M1-SC4B (mg/L)	M1-SC5B (mg/L)
Aluminum	0.2	Dry	Dry	NETS ^(a)	NETS	NETS	NETS ^(a)	<0.05
Arsenic	0.01	Dry	Dry	NETS	NETS	NETS	NETS	0.018
Beryllium	0.004	Dry	Dry	NETS	NETS	NETS	NETS	0.099
Cadmium	0.005	Dry	Dry	NETS	NETS	NETS	NETS	<0.0010
Chloride	400	Dry	Dry	NETS	NETS	NETS	NETS	36.00
Iron	0.6	Dry	Dry	NETS	NETS	NETS	NETS	<0.10
Manganese	0.1	Dry	Dry	NETS	NETS	NETS	NETS	<0.010
pH (SU)	6.5 – 8.5	Dry	Dry	NETS	NETS	NETS	NETS	7.4
Selenium	0.05	Dry	Dry	NETS	NETS	NETS	NETS	<0.0050
Sulfate	500	Dry	Dry	NETS	NETS	NETS	NETS	25.00
TDS	1,000	Dry	Dry	NETS	NETS	NETS	NETS	260

- (a) NETS = Not enough to sample (insufficient water in the well).

Division correspondence dated 7 February 2008 added quarterly seepage return pumping volume to the monitoring requirements. Division correspondence dated 5 March 2010 approved a suspension of pumpback operations at well M1-1-2, and a significant reduction in monitoring frequency (quarterly to annually for former pumpback well M1-1-2 and for

monitoring wells M1-SC1, M1-SC2, M1-SC3A, M1-SC3B, M1-SC4A, and M1-SC4B), because those wells are commonly dry.

The 2017 new Permit included an SOC item (#2) requiring an updated corrective action plan (CAP) to optimize the groundwater remedial and monitoring system. The CAP needed to include a schedule for submittal of an EDC application to install additional groundwater wells to complete the delineation, monitoring, and mitigation of the contaminant plume. The CAP was received and approved by the Division on 18 October 2018.

Ancillary Facilities: Ancillary facilities at the Project include a fuel depot located near the former Mill 1 site, and a blasting contractor facility located on the Carlin West Pit backfill. The Permittee maintains a meteorological station within the approximate area of the Mill 1 TSF. An SOC item in the 2017 Permit required a brief report demonstrating that the station has been upgraded, if necessary, and is being operated to record all data required in the Permit to calculate potential evaporation for a future evaporation cell to receive the Mill 1 TSF draindown solution. The installation of a new weather station was confirmed during a 26 September 2018 site inspection by the Division.

See Figure 1 for locations of site monitoring locations.

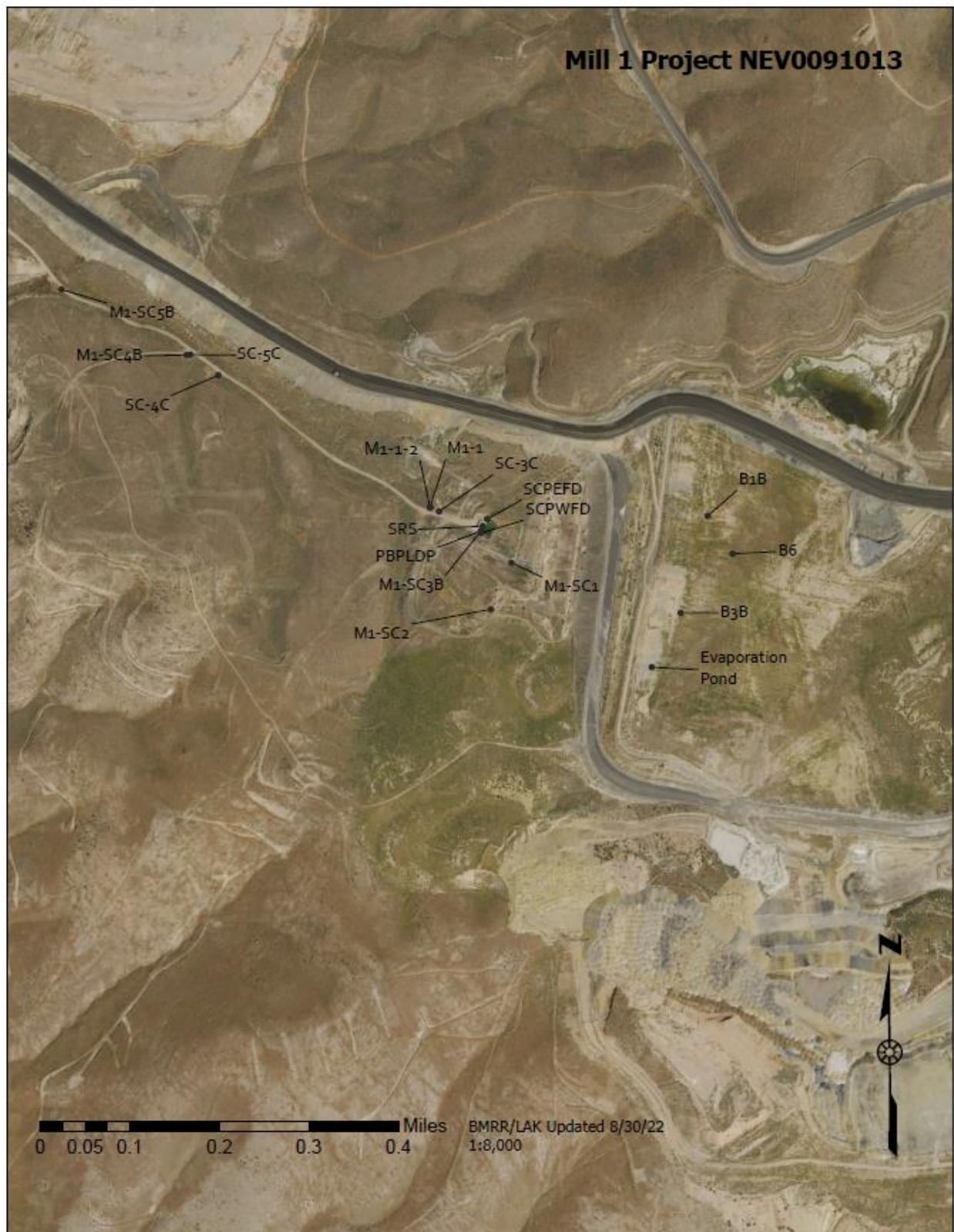


Figure 1: Monitoring locations.

C. **Receiving Water Characteristics**

The Mill 1 Project is located within the upper Sheep Creek drainage in the Tuscarora Mountains. Sheep Creek is an intermittent stream that flows in the Project area only seasonally or in response to storms. From the Mill 1 TSF area, Sheep Creek flows first west-northwest, then south, and finally west out of the Tuscarora Mountains into Boulder Valley. Any surface flow in Sheep Creek that continues into Boulder Valley (i.e., 6.9 miles downstream from the Mill 1 SCP) would ultimately be collected in the Sand Dune Canal, which is operated by Nevada Gold Mines LLC as part of their Boulder Valley Infiltration Project (WPCP NEV0089068). The State of Nevada has not established numerical water quality standards for Sheep Creek.

The groundwater hydrology of the Mill 1 Project area is described in a 1991 Geraghty and Miller report entitled, "Hydrogeologic Investigation for Mill #1 Tailings Storage Facility and Downgradient Drainage Area, Carlin, NV." The report describes a two-aquifer system consisting of a shallow aquifer 15 to 30 feet bgs in the upper alluvium and a deeper aquifer 60 to 100 feet bgs in the lower alluvium, which extends down to the alluvium/bedrock contact. The 1991 Geraghty and Miller report describes the shallow alluvial aquifer as perched and the deeper alluvial aquifer as confined. Based on grain-size analyses and pump tests, the shallow aquifer has a greater hydraulic conductivity than the deeper aquifer. The lateral extent of either aquifer is unknown; hence, the Division has made the conservative assumption that both alluvial aquifers represent potentially usable groundwater pursuant to NAC 445A.361 and must be protected from degradation in accordance with NAC 445A.424.

The gradient of the shallow alluvial aquifer is assumed to follow the Sheep Creek drainage in a generally west-northwesterly direction from the Mill 1 TSF. The gradient in the deeper alluvial aquifer is uncertain, because only three wells have been installed in the deeper aquifer roughly in a line (monitoring wells M1-SC3B, M1-SC4B, and M1-SC5B), which precludes typical triangulation techniques to determine the groundwater gradient direction and magnitude. Some wells screened in each alluvial aquifer have periodically gone dry or had insufficient water to allow sampling, as noted in Tables 2B and 2C. In the shallow alluvial aquifer this may be due primarily to drought and seasonal dryness (possibly exacerbated by short and shallow screen intervals), whereas in the deeper alluvial aquifer this may be due to numerous mine-related dewatering activities in the area.

Based on a pump test conducted at former pumpback well M1-1-2, (Geraghty and Miller, 1991) concluded that the shallow and deeper alluvial aquifers are not hydraulically connected, and boring logs for wells drilled to the deeper aquifer reported dry alluvium between the two aquifers. Another pump test conducted at pumpback well M1-1 showed no response at well M1-1-2 (Geraghty and Miller, 1991), leading Golder to conclude in Appendix B of their 30 October 2014 FPPC for the Mill 1 TSF that either the test was not run long enough, or there is heterogeneity (i.e., lack of hydraulic connection) within the shallow alluvial aquifer.

The background water quality of the deeper alluvial aquifer is good, and meets all Division Profile I reference values, except for elevated arsenic up to approximately 0.018 mg/L, as indicated by the furthest downgradient deeper monitoring well M1-SC5B (see Table 2). The elevated arsenic concentrations in monitoring well M1-SC5B are believed to represent natural background conditions. The background water quality of the shallow alluvial

aquifer is less certain due to a lack of reliably uncontaminated monitoring wells, but an arsenic concentration of 0.011 in shallow pumpback well M1-1 in the first quarter of 2017 may represent background conditions.

Two deeper geologically-controlled bedrock aquifers are present elsewhere in the northern Carlin Trend: the aquifer in the siliceous upper plate of the Roberts Mountains Thrust, and the more productive, but now largely dewatered, aquifer in the carbonate-dominated lower plate of the Roberts Mountains Thrust. No monitoring wells at the Mill 1 Project are known to have intercepted either of the bedrock aquifers.

D. Procedures for Public Comment

The Notice of the Division's intent to issue a Permit authorizing the facility to close, subject to the conditions within the Permit, is being published on the Division website: <https://ndep.nv.gov/posts>. The Notice is being mailed to interested persons on the Bureau of Mining Regulation and Reclamation mailing list. Anyone wishing to comment on the proposed Permit can do so in writing within a period of 30 days following the date the public notice is posted to the Division website. The comment period can be extended at the discretion of the Administrator. All written comments received during the comment period will be retained and considered in the final determination.

A public hearing on the proposed determination can be requested by the applicant, any affected State or intrastate agency, or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings must be conducted in accordance with NAC 445A.403 through NAC 445A.406.

E. Proposed Determination

The Division has made the tentative determination to issue the renewed Permit.

F. Pathway to Final Closure and Permit Termination

In accordance with NAC 445A.409 and 445A.446, for final closure and Permit termination the Permittee must demonstrate to the Division that: 1) all sources at the facility have been stabilized, removed, or mitigated; 2) any applicable requirements in NAC 445A.429, 445A.430, and 445A.431 have been achieved; and 3) sufficient post-closure monitoring has occurred to verify the adequacy of these actions to ensure the long-term protection of waters of the State, human health, and wildlife under the physical, chemical, and climatic conditions reasonably expected to occur at the site. If the facility includes a long-term trust and/or requires perpetual treatment or maintenance, post-closure monitoring may never be reached, and the Division may not be able to terminate the Permit.

The pathway to final closure and Permit termination at this facility includes the following specific actions:

- Complete closure actions as described in the Final Plan for Permanent Closure submitted in 2018;

- Submit a final closure report for the Tailings Storage Facility and the Seepage Collection System (building and ponds);
- Install an evaporation cell downgradient of the TSF to permanently manage draindown;
- Complete remedial activities at the toe of the TSF to eliminate the groundwater contamination plume in accordance with the approved CAP;
- Monitor the facility through major storms and large winter/spring seasons to verify that closed components and the fluid management system remain functional with no potential for degradation of waters of the State;
- Discuss with the Division whether the facility is ready for final closure and Permit termination. If so, submit for review and approval a request for final closure and Permit termination including a demonstration of compliance with all applicable closure requirements (e.g., NAC 445A.379, 445A.409, 445A.424, 445A.429, 445A.430, 445A.431, 445A.446, 445A.447).

The Division may require additional actions if warranted in accordance with site conditions and applicable statutes, regulations, orders, and Permit conditions.

Until the draindown solution is effectively controlled through an E-cell and the plume is remediated, this Permit must remain in effect.

G. Rationale for Permit Requirements

The facility is located in an area where annual evaporation is greater than annual precipitation. Therefore, it must operate under a standard of performance which authorizes no discharge except for those accumulations resulting from a storm event beyond that required by design for containment.

The primary method for identification of escaping process solution will be placed on required routine sampling of downgradient monitoring wells and monitoring of leak detection systems. Specific monitoring requirements can be found in the Water Pollution Control Permit.

The Permit requires that the groundwater remedial and monitoring system shall be operated, and modified when necessary (with prior Division approval), to mitigate the groundwater degradation and to prevent migration or expansion of the contaminant plume. The Permit includes SOC items requiring a CAP to optimize the groundwater remedial and monitoring system, and a revised FPPC with implementation schedule to permanently close the TSF, SCP, and associated components.

H. Federal Migratory Bird Treaty Act

Under the Federal Migratory Bird Treaty Act, 16 U.S. Code 701-718, it is unlawful to kill migratory birds without license or permit, and no permits are issued to take migratory birds using toxic ponds. The Federal list of migratory birds (50 Code of Federal Regulations 10, 15 April 1985) includes nearly every bird species found in the State of Nevada. The U.S. Fish and Wildlife Service (the Service) is authorized to enforce the prevention of migratory bird mortalities at ponds and tailings impoundments. Compliance with State permits may not be adequate to ensure protection of migratory birds for compliance with provisions of Federal statutes to protect wildlife.

Open waters attract migratory waterfowl and other avian species. High mortality rates of birds have resulted from contact with toxic ponds at operations utilizing toxic substances. The Service is aware of two approaches that are available to prevent migratory bird mortality: 1) physical isolation of toxic water bodies through barriers (e.g., by covering with netting), and 2) chemical detoxification. These approaches may be facilitated by minimizing the extent of the toxic water. Methods which attempt to make uncovered ponds unattractive to wildlife are not always effective. Contact the U.S. Fish and Wildlife Service at 2800 Cottage Way, Room W-2606, Sacramento, California 95825, (916) 414-6464, for additional information.

Prepared by: L.A. Kreskey
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